

INTERNATIONAL SEARCH REPORT

PCT/IB2004/002435

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 566 059 B1 (VERDINE GREGORY L ET AL) 20 May 2003 (2003-05-20) column 57, lines 30-37 column 58, line 61 - column 59, line 1 column 61, lines 36-43 column 61, lines 52-55 column 142, line 34 - column 143, line 22 column 163, lines 24-35 -----	1-5,8-13
X	US 5 939 292 A (GELFAND DAVID HARROW ET AL) 17 August 1999 (1999-08-17) column 11, lines 63-66 column 16, lines 22-38 column 5, lines 61-63 column 17, lines 42-47 -----	1-5,8,13
A	US 5 830 655 A (BECKER CHRISTOPHER HANK ET AL) 3 November 1998 (1998-11-03) the whole document -----	

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the International filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the International filing date but later than the priority date claimed

"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the International search

Date of mailing of the International search report

2 March 2005

03.06.2005

Name and mailing address of the ISA

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6566059	B1 20-05-2003	AU 774388 B2 AU 1200400 A BR 9914262 A CA 2344611 A1 CN 1463292 A EP 1117838 A1 JP 2002525129 T NO 20011607 A US 6610492 B1 WO 0018967 A1 US 2003134290 A1 US 2003165880 A1 US 2002150943 A1 US 6500650 B1 US 2003087398 A1 US 6440705 B1 US 6458945 B1	24-06-2004 17-04-2000 22-01-2002 06-04-2000 24-12-2003 25-07-2001 13-08-2002 31-05-2001 26-08-2003 06-04-2000 17-07-2003 04-09-2003 17-10-2002 31-12-2002 08-05-2003 27-08-2002 01-10-2002
US 5939292	A 17-08-1999	AT 278020 T AU 714929 B2 AU 3319797 A BR 9704260 A CA 2210951 A1 CN 1177640 A ,C CZ 9702299 A3 DE 69730926 D1 EP 0823479 A2 ES 2227640 T3 HU 9701341 A2 IL 121441 A JP 3170229 B2 JP 10066588 A NO 973595 A PL 321478 A1 RU 2235773 C2 TW 528802 B	15-10-2004 13-01-2000 12-02-1998 15-09-1998 06-02-1998 01-04-1998 17-06-1998 04-11-2004 11-02-1998 01-04-2005 28-06-1999 16-07-2000 28-05-2001 10-03-1998 09-02-1998 16-02-1998 10-09-2004 21-04-2003
US 5830655	A 03-11-1998	US 5700642 A AU 695705 B2 AU 5635296 A CA 2220418 A1 CN 1191575 A DE 69605669 D1 DE 69605669 T2 EP 0828855 A1 JP 3437184 B2 JP 11505127 T WO 9637630 A1	23-12-1997 20-08-1998 11-12-1996 28-11-1996 26-08-1998 20-01-2000 27-07-2000 18-03-1998 18-08-2003 18-05-1999 28-11-1996

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Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:
 - a. type of material
 - a sequence listing
 - table(s) related to the sequence listing
 - b. format of material
 - in written format
 - in computer readable form
 - c. time of filing/furnishing
 - contained in the international application as filed
 - filed together with the international application in computer readable form
 - furnished subsequently to this Authority for the purpose of search
2. In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-4 (partially), 5 (totally), 8-13 (partially)

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4 (partially), 5 (totally), 8-13 (partially)

A method for the detection in a given DNA sequence of DNA mutation, SNP, and insertions and deletions comprising the steps of:

- a) producing replicates with an engineered polymerase of said given DNA sequence, with part or all of at least one of the four natural DNA bases exchanged against a not natural base,
- b) using said not natural base to cleave the replicate(s) obtained in step a) and to produce a DNA product presenting sequence-specific fragments,
- c) analysing said sequence-specific fragments obtained in step b) by mass spectrometry to get sequence-specific fragment patterns,
- d) and using the sequence-specific fragment patterns obtained in step c) to identify sequence changes relative to a reference to said given DNA sequence, wherein in particular the not natural base in step a) is an RNA base (ATP, GTP, CTP or UTP).

A kit for detection in a given DNA sequence of DNA mutations, SNP, and insertions and deletions for implementing the said method comprising i) an engineered DNA polymerase, ii) a set of non-natural bases and dNTPs wherein the non-natural bases are RNA bases (ATP, GTP, CTP or UTP), iii) a buffer.

2. claims: 1-4 (partially), 6 (totally), 8-13 (partially)

The same method and kit as herein above wherein the not natural base is a phosphorothioate base or a phosphoroselenoate base.

3. claims: 1-4 (partially), 7 (totally), 8-13 (partially)

The same method and kit as herein above wherein the not natural base in step a) is a photochemically cleavage inducible base.
